

CLAIMS

We claim:

1. A unitized mat to facilitate growing plants comprising:

at least two polymeric material layers sized and shaped to cover an area immediately around at least one plant and selectively bonded together to define fluid-conveying passageways forming one or more distribution headers and a flow restricting means;

an inlet means for delivery of a fluid into the distribution headers throughout the polymeric material layers, said inlet means being in fluid communication with the distribution headers; and

an outlet means for dispensing fluid into a root zone area covered by at least one layer of said polymeric material layers, said outlet means being in fluid communication with said flow restricting means,

wherein said flow restricting means for metering fluid is in fluid connection with the distribution header and a multi-dimensional array of said outlet means.

2. The unitized mat of Claim 1, wherein said fluid conveying passageways are comprised of formed recesses within one or more surfaces of the polymeric material layers.

3. The unitized mat of claim 1, wherein said distribution header has an integral filter at an end thereof.

4. The unitized mat of claim 3, wherein said integral filter comprises a plurality of sediment traps.

5. The unitized mat of claim 1, wherein said polymeric material layers form a generally impervious barrier to gas, fluid, light, and undesired plants.

6. The unitized mat of claim 1, wherein the polymeric material layers have a circular shape, elliptical shape, or a polygonal shape.

7. The unitized mat of claim 1, wherein the polymeric material layers have an exterior color.

8. The unitized mat of Claim 7, wherein the polymeric material layers have different colors.

9. The unitized mat of claim 8, wherein the polymeric material layers are invertable.

10. The unitized mat of Claim 1, wherein the polymeric material layers have one or more reflective surfaces.

11. The unitized mat of Claim 1, wherein the polymeric material layers have one or more absorptive surfaces.

12. The unitized mat of claim 1, further comprising:

an additional polymeric material layer selectively bonded to the polymeric material layers and forming at least one region of air.

13. The unitized mat of Claim 1, wherein the polymeric material layers are comprised of:
a material selected from a group consisting of thermoplastics, polyethylene, polypropylene, polyester, nylon, thermoplastic elastomers and thermosets; and
a chemical stabilizer.

14. The unitized mat of Claim 1, wherein at least one of the polymeric material layers is of bicomponent construction with a single surface having a lower-melt-temperature layer.

15. The unitized mat of Claim 1, wherein the polymeric material layers have a perforation in which the plant extends therethrough.

16. The unitized mat of Claim 15, wherein said outlet means are located in proximity to said perforation for the plant.

17. The unitized mat of Claim 15, wherein multiple said outlet means and perforations are positioned at pre-determined planting sites.

18. The unitized mat of Claim 15, wherein said outlet means comprise a plurality of outlet means located around said perforation for the plant.

19. The unitized mat of Claim 15, wherein said outlet means and the perforations are selectively openable.

20. The unitized mat of claim 1, further comprising:

a mulch placed on a top surface of the polymeric material layers.

21. The unitized mat of Claim 20, wherein said mulch is affixed to one of the polymeric material layers.

22. The unitized mat of Claim 20, wherein said mulch is artificial.

23. The unitized mat of Claim 20, wherein a portion of said mulch comprises scrap or recycled polymeric material.

24. The unitized mat of Claim 1, wherein the polymeric material layers have aeration perforations formed therethrough within the area immediately around the plant and not within said fluid conveying passageways.

25. The unitized mat of claim 1, further comprising:

one or more seeds placed approximately adjacent to said outlet means.

26. The unitized mat of Claim 1, wherein said flow restricting means has a flow length equal to or greater than one foot.

27. The unitized mat of Claim 26, wherein said fluid throughout said outlet means is supplied with an inlet pressure of 10 pounds per square inch, wherein said fluid flows through each outlet means at approximately 0.10 gallons per hour or less, and wherein said flow restricting means has an expanded cross section to resist clogging by contaminants.

28. The unitized mat of Claim 26, wherein said fluid throughout said outlet means is supplied with an inlet pressure of 10 pounds per square inch, wherein said fluid flows through each outlet means at approximately 0.010 gallons per hour or less, and wherein flow restricting means has an expanded cross section to resist clogging by contaminants.

29. A process for producing a unitized mat to facilitate the growth of plants, comprising the steps of:

extruding a first polymeric material layer;

laminating a second polymeric layer to said first polymeric material layer; and

selectively bonding said first and second polymeric material layers so as to create fluid conveying passageways between said first and second polymeric material layers defined by bonded and non-bonded areas.

30. The process of Claim 29, further comprising:

vacuum forming fluid conveying passageways into said first polymeric material layer.

31. The process of Claim 30, wherein said steps of vacuum forming and selectively bonding are performed after the step of extruding approximately at melting temperature of the first and second polymeric material layers.

32. The process of Claim 29, wherein said step of selectively bonding the polymeric material layers comprises laser bonding the polymeric material layers together .

33. The process of Claim 32, wherein said step of laser bonding the polymeric material layers comprises laser bonding the polymeric material layers together with a plurality of lasers.

34. The process of claim 32, further comprising:

introducing a pressurized fluid within the non bonded areas to inflate and open the fluid conveying passageways prior to use.

35. The process of claim 29, further comprising:

introducing a pressurized fluid within the non bonded areas to inflate and open the fluid conveying passageways prior to use.

36. A process for producing a unitized mat for facilitating the growth of plants, comprising the steps of:

extruding a first polymeric material layer,
selectively printing an adhesive on said first polymeric material layer, and
laminating a second polymeric material layer to said first polymeric material layer to create fluid conveying passageways between said first and second polymeric material layers defined by bonded and non bonded areas.

37. The process of claim 36, further comprising:

introducing a pressurized fluid within the non bonded areas to inflate and open the fluid conveying passageways prior to use.

38. A method of enhancing the growth of plants comprising:

forming a unitized mat having at least one polymeric material layer, said polymeric material layer having a selected color, reflective properties, barrier properties, and shape to act as an effective artificial mulch; and

disbursing water through a fluid passageway in said unitized mat through irrigation watering outlets at one or more selected rates and locations.

39. The method of Claim 38, further comprising:

forming perforations which result in an opening large enough for a plant and spaced at optimum distances to enhance plant growth.

40. A method to facilitate growing plants comprising:

forming a unitized mat of at least two polymeric material layers sized and shaped to cover an area immediately around at least one plant, the polymeric material layers being selectively bonded together to define fluid-conveying passageways forming one or more distribution headers and one or more flow restrictors;

delivering a fluid through an inlet into the distribution headers throughout the polymeric material layers;

disbursing and metering said fluid from the distribution headers through the flow restrictors to a multi-dimensional array of outlets; and

dispensing said fluid through one or more outlets into a root zone area covered by at least one layer of the polymeric material layers.

41. A method of enhancing the growth of plants comprising:

adapting a unitized mat to act as an artificial mulch, and

disbursing and flow restricting irrigation fluid through said unitized mat to a multi-dimensional array of outlet means.